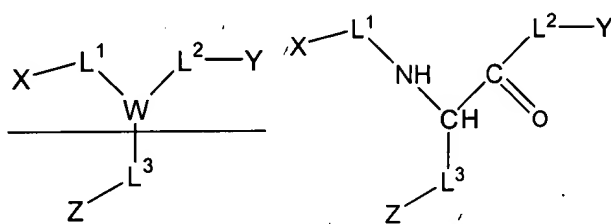


This listing of claims will replace all prior versions and listings of claims in the application.

Listing of Claims:

- 1 1. (Currently Amended) A heterofunctional crosslinking reagent having
2 the formula:



3 wherein

4 ~~W is a covalent core component;~~

5 ~~L¹, L² and L³ are each independently linking groups selected from the group~~
6 ~~consisting of a bond, a substituted or unsubstituted (C₂-C₂₄) alkylene group, a~~
7 ~~substituted or unsubstituted (C₂-C₂₄) heteroalkylene group, a~~
8 ~~polyethyleneglycol group, a polyalcohol group, a polyamine group, a~~
9 ~~polyester group and a polyphosphodiester group;~~

10 ~~X is a reversibly covalent or non-covalent protein tag binder that specifically binds to~~
11 ~~a protein tag portion of a protein;~~

12 ~~Y is a activatable photoactivatable covalent crosslinking group adapted to covalently~~
13 ~~link the heterofunctional crosslinking reagent at or adjacent to said protein~~
14 ~~tag; and~~

15 ~~Z is a protected or unprotected chemical crosslinking group that covalently links the~~
16 ~~heterofunctional crosslinking reagent to a label or support wherein Z is~~
17 ~~rendered inactive when protected.~~

1 2.-4. (Canceled)

1 5. (Original) A heterofunctional crosslinking reagent of claim 1, wherein
2 L¹ is a cleavable linking group.

1 6.-8. (Canceled)

1 9. (Original) A heterofunctional crosslinking reagent of claim 1, wherein
2 X is selected from the group consisting of metal chelating groups, peptides, an
3 organoarsenical moiety and small molecule ligands or inhibitors.

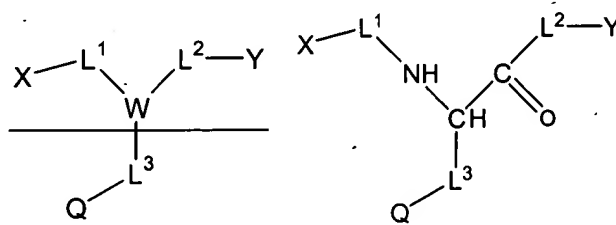
1 10. (Original) A heterofunctional crosslinking reagent of claim 1, wherein
2 Y is a member selected from the group consisting of aryl ketones, azides, diazo compounds,
3 diazirenes, and ketenes.

1 11. (Canceled)

1 12. (Original) A heterofunctional crosslinking reagent of claim 1, wherein
2 Z is a protected or unprotected member selected from the group consisting of acyl
3 hydrazines, olefins, dicarbonyl groups, epoxides, aldehydes, reactive esters, isocyanates,
4 thioisocyanates, carboxylic acid chlorides, disulfides, sulfonate esters and sulfhydryl groups.

1 13.-23. (Canceled)

1 24. (Currently Amended) A protein labeling reagent having the formula:



2 wherein

3 ~~W is a covalent core component;~~

4 L¹, L² and L³ are each independently ~~linking groups~~ selected from the group

5 consisting of a bond, a substituted or unsubstituted (C₂-C₂₄) alkylene group, a

substituted or unsubstituted (C₂-C₂₄) heteroalkylene group, a polyethyleneglycol group, a polyalcohol group, a polyamine group, a polyester group and a polyphosphodiester group;

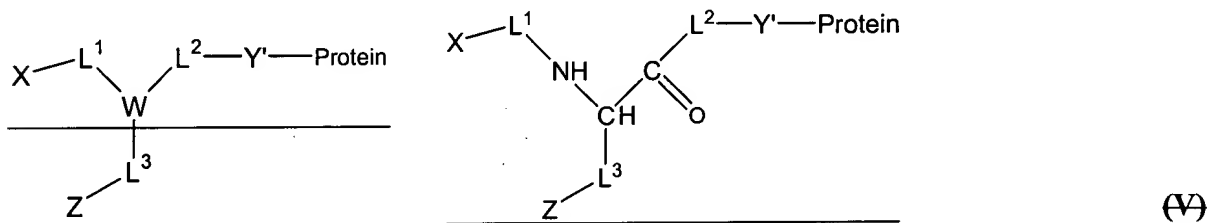
X is a ~~reversibly covalent~~ or non-covalent protein tag binder that specifically binds to a protein tag portion of a protein;

Y is a ~~activatable~~ photoactivatable covalent crosslinking group adapted to covalently link the heterofunctional crosslinking reagent at or adjacent to said protein tag; and

Q is a label or a reporter group.

25. (Canceled)

26. (Currently Amended) A protein conjugate comprising a protein and a heterofunctional crosslinking reagent, said conjugate having the formula:



wherein

~~W is a covalent core component;~~

L¹, L² and L³ are each independently linking groups selected from the group consisting of a bond, a substituted or unsubstituted (C₂-C₂₄) alkylene group, a substituted or unsubstituted (C₂-C₂₄) heteroalkylene group, a polyethyleneglycol group, a polyalcohol group, a polyamine group, a polyester group and a polyphosphodiester group;

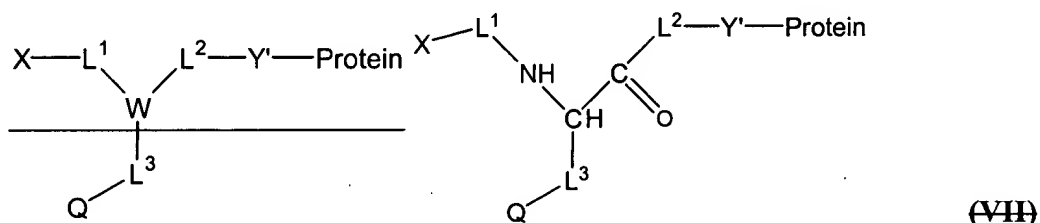
X is a ~~reversibly covalent~~ or non-covalent protein tag binder that specifically binds to a protein tag portion of a protein;

12 Y' is the residue of a ~~activatable~~ photoactivatable covalent crosslinking group after
13 formation of a covalent linkage to said protein, said photoactivatable covalent
14 crosslinking group covalently attached at or adjacent to said protein tag; and
15 Z is a protected or unprotected ~~covalent crosslinking~~ group that covalently links the
16 heterofunctional crosslinking reagent to a label or support wherein Z is
17 rendered inactive when protected.

1 27. (Original) A protein-conjugate comprising a protein and a covalently
2 attached heterofunctional linking group of claim 1.

1 28. (Canceled)

1 29. (Currently Amended) A protein composition having the formula:



2 wherein

3 ~~W is a covalent core component;~~

4 ~~L¹ is a linking group~~ selected from the group consisting of a substituted or
5 unsubstituted (C₂-C₂₄) alkylene group, a substituted or unsubstituted (C₂-C₂₄)
6 heteroalkylene group, a polyethyleneglycol group, a polyalcohol group, a
7 polyamine group, a polyester group and a polyphosphodiester group;

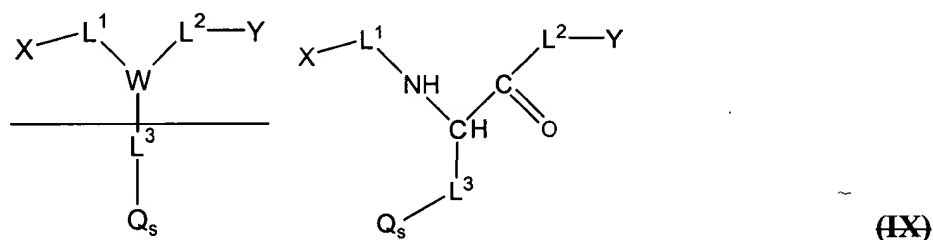
8 ~~L² and L³ are each independently a bond or a linking group~~ selected from the group
9 consisting of a bond, a substituted or unsubstituted (C₂-C₂₄) alkylene group, a
10 substituted or unsubstituted (C₂-C₂₄) heteroalkylene group, a
11 polyethyleneglycol group, a polyalcohol group, a polyamine group, a
12 polyester group and a polyphosphodiester group;

13 X is hydrogen or a protein tag binder that specifically binds to a protein tag portion of
14 a protein;

15 Y' is a ~~crosslinking~~ photocrosslinking group that has been activated and covalently
16 attached to a protein at or adjacent to said protein tag; and
17 Q is a label or a solid support.

1 30. (Canceled)

1 31. (Currently Amended) A support-bound crosslinking group having the
2 formula:



3 wherein

4 ~~W is a covalent core component~~;

5 L¹, L² and L³ are each independently ~~linking groups~~ selected from the group
6 consisting of a bond, a substituted or unsubstituted (C₂-C₂₄) alkylene group, a
7 substituted or unsubstituted (C₂-C₂₄) heteroalkylene group, a
8 polyethyleneglycol group, a polyalcohol group, a polyamine group, a
9 polyester group and a polyphosphodiester group;

10 X is a ~~reversibly covalent or~~ non-covalent protein tag binder that specifically binds to
11 a protein tag portion of a protein;

12 Y is a ~~activatable~~ photoactivatable covalent crosslinking group adapted to covalently
13 link the heterofunctional crosslinking reagent at or adjacent to said protein
14 tag; and

15 Qs is a member selected from the group consisting of a solid support, a monolayer
16 attached to a support and a thinfilm attached to a support.

1 32-77. (Canceled)

- 1 78. (New) A heterofunctional crosslinking reagent of claim 1, wherein X
2 is an antibody or antibody fragment.